U.S. Department of Energy
Office of River Protection
P.O. Box 450
Richland, Washington 99352

03-OSR-0014

Mr. R. F. Naventi, Project Manager
Bechtel National, Inc.
2435 Stevens Center
Richland, Washington 99352

Dear Mr. Naventi:

CONTRACT NO. DE-AC27-01RV14136 – QUESTION ON AUTHORIZATION BASIS CHANGE NOTICE (ABCN) 24590-WTP-ABCN-ESH-02-027

References:

1. BNI letter from A. R. Veirup to M. K. Barrett, ORP, "Transmittal for Approval – Authorization Basis Change Notice 24590-WTP-ABCN-ESH-02-027, Revision 0, 'Revision to HLW PSAR to Reflect Proposed Design Modifications to Melter Pour Spout and Vessel Stub Outs'," CCN: 038761, dated September 11, 2002.

2. ORP letter from R. J. Schepens to R. F. Naventi, BNI, "Delay for Approval of Authorization Basis Change Notice (ABCN) 24590-WTP-ABCN-ESH-02-027, Rev. 0, Revision to High Level Waste (HLW) Preliminary Safety Analysis Report (PSAR) to Reflect Proposed Design Modifications to Melter Pour Spout and Vessel Stub Outs," 02-OSR-0494, dated October 21, 2002.

This letter transmits question HLW-PSAR-260 resulting from the ongoing review of the subject ABCN 24590-WTP-ABCN-ESH-02-027 submitted to the U.S. Department of Energy, Office of River Protection (ORP) in Reference 1. In earlier correspondence (Reference 2), the ORP had informed Bechtel National, Inc., that review of this ABCN was being postponed until completion of the High Level Waste Construction Authorization Request review, which occurred on November 13, 2002.

The attachment to this letter contains a question and request for information required for ORP to complete its review of the subject ABCN. A prompt response will enable the review to be completed and, if appropriate, the Safety Evaluation Report issued. If you have any questions, please contact me, or your staff may call L. F. Miller, Jr., WTP Safety Regulation Division, (509) 376-6817.

Sincerely,

Roy J. Schepens
Manager

OSR:RWG

Attachment

WTP Safety Regulation Division (OSR)	OSR Review Team Questions for BNI
Question # (assigned by ATL): HLW-PSAR-260	**Date Opened:** January 14, 2003
Place "X" if answering "yes":	**Date to Contractor:** January 16, 2003
Limited Rights Information? ___	**Date of Response:**
Team Accepted? ___	**Date Closed:**
	Reviewer:

Cited Reference: DOE/RL-96-0003, Section 4.3.2.A, Item 15 requires: "An analysis of the safety basis for the facility (safety envelope) in terms of physical design, structures with prescribed safety functions, systems with prescribed safety functions, equipment with prescribed safety functions, operating modes, operating conditions, off-normal internal events considered, external events considered, assumptions made, uncertainties in data and analyses, safety limits, and operating limits."

Cited Submittal Text: HLW PSAR, Volume IV, Section 3.3.3.2, p. 4 of 72 (24590-WTP-ABCN-ESH-02-027) states: "Control strategies to minimize the risk of loss of piping confinement and subsequent release of radioactive slurry outside of the wet process cell include minimizing impacts to piping (bulge structure) and piping design."

HLW PSAR, Volume IV, Section 3.4.1.1.2.2, p. 18 of 72 (24590-WTP-ABCN-ESH-02-027) states: "Process lines in bulge will be pipe-in-pipe to ensure confinement. Secondary pipe will drain to the wet process cell (SCR-PIPN/N0010). Pipe-in-pipe design prevents leaks during credible impacts to the bulge."

HLW PSAR, Volume IV, Section 3.4.1.1.2.2, p. 18 of 72 (24590-WTP-ABCN-ESH-02-027) states: "The above controls are ITS. Additional non-ITS protection is provided by the purge air system…The calculation notes that the jib crane will not be moved into the C2 corridor and installed until needed for contingency modification to the bulge."

HLW PSAR, Volume IV, Section 3.4.1.1.2.6, p. 20 of 72 (24590-WTP-ABCN-ESH-02-027) states: "The encasement pipe is not exposed to liquids unless the primary pipe leaks. Subsequent failure of the secondary pipe, should the primary pipe leak, is not eminent within a reasonable time frame for detection of the primary pipe leak via the cell leak detection system."

HLW PSAR, Volume IV, Section 3.4.1.1.2.7, p. 20 of 72 (24590-WTP-ABCN-ESH-02-027) states: "Tables 4-1, 4-2, and 5-1 summarize the ITS SSCs and candidate TSRs identified to prevent or mitigate spills associated with the spare process piping (which is evaluated seperately (sic) due to its potential for leaks outside the wet process cell. For each of the ITS SSCs and the candidate TSRs, the hazard prevented or mitigated is identified, and the safety function provided. Preliminary ITS SSC safety classifications and candidate TSR elements (safety limit, limiting control settings, limiting conditions of operation, administrative controls) are also identified."

HLW PSAR, Volume IV, Section 4.3.1.3, p. 28 of 72 (24590-WTP-ABCN-ESH-02-027) states: "Cells and associated bulges are seismic category (SC)-I. The facility structure and annex are designed to SC-I and PC-3 standards to ensure that the structure does not negatively affect any ITS SSCs. The structure and cells are designed to SRD Safety Criteria 4.1-2, 4.1-3, 4.1-5, and 4.2-1. SDC SSCs will meet quality level (QL)-1 requirements."

HLW PSAR, Volume IV, Section 4.3.7, p. 30 of 72 (24590-WTP-ABCN-ESH-02-027) states: "The following vessels are classified as SDC: • Concentrate receipt vessels (and associated coaxial containment piping."

HLW PSAR, Volume IV, Section 4.3.7.5, p. 31 of 72 (24590-WTP-ABCN-ESH-02-027) - The first paragraph is revised by 24590-WTP-ABCN-ESH-02-027 to state: "The proposed design of the HLW SDC vessels and coaxial containment piping is adequate to meet the required safety function…" However, the second paragraph of this section is unchanged and reads: "The SDC performance criterion of the vessel is to remain intact to support operation of the hydrogen purge system after the design basis earthquake. The SDS criteria is to provide a confinement barrier for process liquids under normal process conditions."

HLW PSAR, Volume IV, Section 4.3.7.6, p. 31 of 72 (24590-WTP-ABCN-ESH-02-027) – The first paragraph is revised by 24590-WTP-ABCN-ESH-02-027 to state: "The vessels and coaxial containment piping will be designed to maintain structural integrity…" However, the second paragraph of this section is unchanged and reads: "The vessel structural support will maintain vessel integrity for DBEs."

HLW PSAR, Volume IV, Appendix A, p. 66 of 72 (24590-WTP-ABCN-ESH-02-027) includes CSD record CSD-HHCP/N0033 for the hazardous situation of hydrogen generation in the spare process lines due to insufficient process air flow leading to potential buildup of flammable concentration and explosion.

Calculation 24590-HLW-U4C-U78T-00007, Revision C, dated 8/19/02, subject: Design Basis Event – HLW Liquid Spills, Section 5.1.2 entitled "Initiating Event Frequency," sheet 14 states: "Total pipe length than can result in a spill to the cell (assuming loss of air flow) is 61 ft, adding stub out line length to the length of the purge air line estimated to be below vessel liquid level. Total length is rounded to 60 ft, given the uncertainty of the pipe length estimates."

Question: a) On what basis does BNI conclude that adequate safety is maintained given the potential for hydrogen build-up in the spare process lines (concentrate receipt vessel stub out lines) (CSD record CSD-HHCP/N0033) and a process air purge that is non-ITS (HLW PSAR, Volume IV, Section 3.4.1.1.2.2)?

b) On what basis were changes to Table 4-1 not included with the ABCN, given that the ABCN introduces new SDC SSCs [e.g., bulges, spare process piping (pipe in pipe)] into the HLW design (HLW PSAR, Volume IV, Sections 3.3.3.2, 4.3.1.3, 4.3.7)?

c) On what basis does BNI conclude that the SDC performance criterion (HLW PSAR, Volume IV, Section 4.3.7.5) and structural support requirements (HLW PSAR, Volume IV, Section 4.3.7.6) were not applicable to the coaxial containment piping?

d) On what basis did BNI conclude that controls on the use of jib crane, fork lifts, etc. (HLW PSAR, Volume IV, Sections 3.3.3.2 and 3.4.1.1.2.2) were not an administrative control that should be included in HLW PSAR, Volume IV, Section 5.5.13?

e) On what basis did BNI conclude that the slope requirement for the coaxial containment piping (HLW PSAR, Volume IV, Sections 3.3.3.2 and 3.4.1.1.2.2) was not a design feature that should be included in HLW PSAR, Volume IV, Sections 4.3.7.6 and 5.6.2?

f) On what basis does BNI conclude that it is conservative and appropriate to round down an estimated piping length to account for uncertainty of the pipe length estimates (Calculation 24590-HLW-U4C-U78T-00007, Revision C, dated 8/19/02, subject: Design Basis Event – HLW Liquid Spills, Section 5.1.2 entitled "Initiating Event Frequency," sheet 14)?

g) What is the intent of the ABCN statement "is not eminent within a reasonable time frame for detection of the primary pipe leak via the cell leak detection system" (HLW PSAR, Volume IV, Section 3.4.1.1.2.6)?

Explanation/Discussion: g) The ABCN language is not clear as to what argument is being made concerning the adequacy of the secondary containing piping and the wet process cell leak detection system to ensure that leaks to the process bulge are prevented.

Contractor Response:

Disposition: